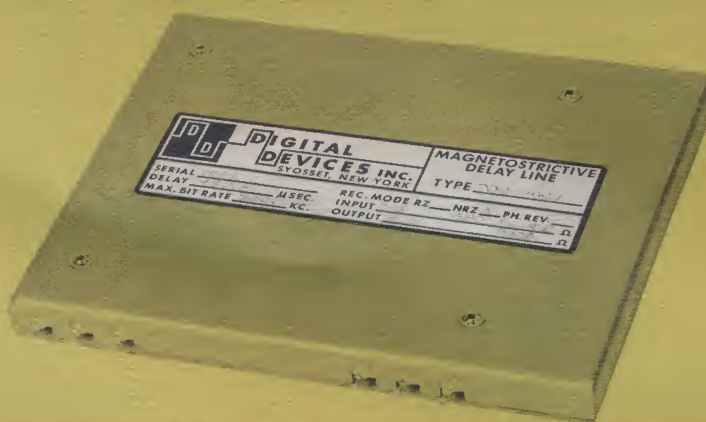


# MAGNETOSTRICTIVE DELAY LINES



- ECONOMICAL . . .** Magnetostrictive delay lines are lower in initial cost and require less auxiliary circuitry. Lower power consumption.
- FAST . . . . .** Bit rates in excess of 2 megacycles are readily accommodated with conventional magnetostrictive delay lines. Access times depend on storage capacity.
- FLEXIBLE . . . . .** Delay line manufacturing techniques offer users a continuous range of bit capacities from 1 bit to tens of thousands in a single unit. Operation can be synchronized with system clocks.
- DEPENDABLE . . .** Absence of wearing parts gives delay lines unlimited life without maintenance. They are ready for use instantaneously without warmup or startup time.
- ADAPTABLE . . . .** Delay lines can be adapted to a wide variety of digital and analog applications over a wide range of environmental conditions. Modern packaging techniques provide compactness with extreme form factor flexibility.
- EXPANDABLE . . .** Memory systems are readily expanded by adding more delay line elements. A number of lines may be operated in parallel, or "corner turners" applied where word parallel operation is desired.
- AVAILABLE . . . .** Fast deliveries, with or without electronics, can be offered and fulfilled. Even special prototypes can be produced quickly and economically. Production costs are extremely low for quantity orders.

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**DIGITAL**

**DEVICES INC.**

516 WA 1-2400

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### What is a Magnetostrictive Delay Line?

It is a device that imparts a *time delay* in the transmission of an electrical signal. The signal is said to be "stored" while being delayed. By introducing signals in serial form, and applying electronic amplification to reshape delayed signals for recirculation, long term storage of large quantities of information is achieved. Bits are added, removed or altered by applying appropriate logic functions.

### How do they work?

In a magnetostrictive delay line, electrical signals are converted to acoustic energy by an *input transducer* that sends a stress wave down a tape and/or wire travelling at the speed of sound. At the other end, an *output transducer* converts the acoustic wave to an electrical signal for amplification, reshaping and logic-controlled recirculation. Ask your DD representative for your free copy of Delay Line Application Notes.

### Why Digital Devices, Inc.?

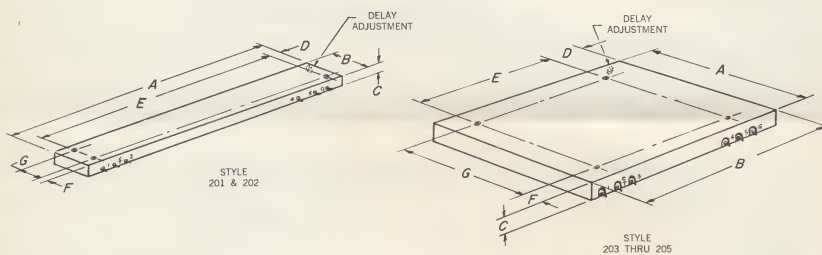
DDI boasts a highly experienced engineering staff working with skilled technicians and production personnel and the finest equipment available to develop and manufacture delay lines to meet virtually any customer specs. A few standard packages are listed below. All solid-state electronic modules are available at low cost. Lines and cards are available as separate products or in completely integrated memory systems.

## MAGNETOSTRICTIVE DELAY LINE CHARACTERISTICS

| LINE<br>STYLE | STRESS<br>MODE <sup>1</sup> | MIN<br>DELAY<br>μsec | MAX<br>DELAY<br>μsec | MAX BIT RATE FOR SPECIFIED DELAY |                 |                |              |                |                 | DELAY<br>ADJ.<br>μsec | DELAY DRIFT <sup>3</sup> μsec |        |        |
|---------------|-----------------------------|----------------------|----------------------|----------------------------------|-----------------|----------------|--------------|----------------|-----------------|-----------------------|-------------------------------|--------|--------|
|               |                             |                      |                      | NON RETURN TO ZERO               |                 | PHASE REVERSAL |              | RETURN TO ZERO |                 |                       | 15-35°C                       | 5-45°C | 0-60°C |
|               |                             |                      |                      | MIN<br>DELAY                     | MAX<br>DELAY    | MIN<br>DELAY   | MAX<br>DELAY | MIN<br>DELAY   | MAX<br>DELAY    |                       |                               |        |        |
| 201           | L                           | 5                    | 32                   | 2.5 Mc                           | 2.1 Mc          | 1.5 Mc         | 1.2 Mc       | 1.3 Mc         | 1.1 Mc          | VAR <sup>2</sup>      | .11                           | .20    | .30    |
| 202           | L                           | 32                   | 50                   | 2.1                              | 2.0             | 1.3            | 1.2          | 1.1            | 1.0             | VAR <sup>2</sup>      | .16                           | .31    | .47    |
| 203-1         | T                           | 50                   | 750                  | 2.3                              | 2.0             | 1.25           | 1.15         | 1.15           | 1.1             | ±2                    | .03                           | .08    | .17    |
| 203-2         | T                           | 750                  | 2000                 | 2.0                              | 1.5             | 1.15           | 1.1          | 1.1            | 1.0             | ±2                    | .06                           | .13    | .36    |
| 203-3         | T                           | 2000                 | 3000                 | 1.5                              | NA <sup>4</sup> | 1.1            | 0.9          | 1.0            | 0.8             | ±2                    | .10                           | .17    | —      |
| 204-1         | T                           | 50                   | 3000                 | 2.3                              | 1.9             | 1.25           | 1.2          | 1.15           | 1.1             | ±4                    | .06                           | .13    | .30    |
| 204-2         | T                           | 3000                 | 6000                 | 1.9                              | NA <sup>5</sup> | 1.2            | 0.8          | 1.1            | NA <sup>5</sup> | ±4                    | .13                           | .23    | —      |
| 205-1         | T                           | 50                   | 4500                 | 2.3                              | 1.8             | 1.25           | 1.1          | 1.15           | 0.9             | ±4                    | .07                           | .14    | .28    |
| 205-2         | T                           | 4500                 | 10,000               | 1.8                              | NA <sup>5</sup> | 1.1            | 0.7          | 0.9            | NA <sup>5</sup> | ±4                    | .18                           | .37    | —      |

1. L = Longitudinal, T = Torsional.
2. Continuously variable over specified range.
3. Over specified temp range for max delay.

4. Not recommended for NRZ.
5. Not recommended for RZ or NRZ.



### ORDERING INFORMATION

Free delay line check sheets are available from DD or your local representative to assist you in furnishing full specifications with your delay line requests for quotation.

| LINE STYLE | PACKAGE DIMENSIONS |     |       |     |     |      |    |
|------------|--------------------|-----|-------|-----|-----|------|----|
|            | A                  | B   | C     | D   | E   | F    | G  |
| 201        | 11                 | 1½  | 7/16  | 3/8 | 10¼ | 7/32 | 1¼ |
| 202        | 15                 | 1½  | 7/16  | 3/8 | 14¼ | 7/32 | 1¼ |
| 203-1      | 4½                 | 5½  | 15/32 | 1¼  | 3¾  | 5/8  | 3¼ |
| 203-2      | 4½                 | 5½  | 23/32 | 1¼  | 3¾  | 5/8  | 3¼ |
| 203-3      | 4½                 | 5½  | 31/32 | 1¼  | 3¾  | 5/8  | 3¼ |
| 204-1      | 7½                 | 8½  | 15/32 | 1¼  | 6¼  | 5/8  | 6¼ |
| 204-2      | 7½                 | 8½  | 23/32 | 1¼  | 6¼  | 5/8  | 6¼ |
| 205-1      | 10½                | 11½ | 15/32 | 1½  | 8¾  | 1½   | 7½ |
| 205-2      | 10½                | 11½ | 23/32 | 1½  | 8¾  | 1½   | 7½ |

#### NOTES:

1. All mounting holes are threaded #6-32 through.

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